

Disease Resistance

- Host varieties are classified as susceptible or resistant according to their response to the concerned pathogen.
- The various reactions of the hosts to the various pathogens may be grouped in to the following types:
 - (i) Susceptible reaction
 - (ii) Immune reaction
 - (iii) Resistance
 - (iv) Tolerance

Vertical and Horizontal Resistances of Biotic Stress

The terms vertical and horizontal resistances were introduced by Van der plank and are widely used.

(i) Vertical Resistance

(ii) Horizontal resistance

Vertical Resistances of Biotic Stress

- It is also known as race-specific, pathotype – specific or simply specific resistance
- It is generally determined by major genes and is characterised by pathotype specificity
- (pathotype: Strain of a pathogen virulent toward a specific resistance gene of the host).
- Pathotype – specificity denotes that the host carrying a gene for vertical resistance is attacked by only that pathotype, which is virulent towards that resistance gene.
- To all other pathotypes the host will be resistant.

Vertical Resistances of Biotic Stress(cont....)

- Thus an avirulent pathotype will produce an immunic response, i.e.' $r = 0$
- But the virulent pathotype will lead to the susceptible reaction, i.e., $r = 1$.
- Clearly, immunic or susceptible response in case of vertical resistance depends on the presence of virulent pathotype.
- When the virulent pathotype becomes frequent, epidemics are common in the case of vertical resistances.

(ii) Horizontal Resistance of Biotic Stress

It is known as race-nonspecific resistance, pathotype nonspecific resistance, and partial or general resistance.

Horizontal resistance is generally controlled by polygenes and is pathotype– nonspecific. That is why it is also known as general resistance.

In the case of horizontal resistance, reproduction rate of the pathogen is never zero, but it is less than one ($r > 0$ but < 1).

Horizontal resistance, therefore, does not prevent the development of symptoms of the disease, but it slows down the rate of spread of the disease in the population.